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The Journal of HEREDITY

A monthly publication devoted to Plant Breeding Animal Breeding and Eugenics

TWINS FROM A TWIN-BEARING HERD
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A Juiceless Navel Orange
Shamel, Pomeroy and Caryl

The Mulatto Problem
Ernest Dodge

Immigration and Eugenics

Purple Plumules in Maize
Merle T. Jenkins

Development of Plant Tumors
Erwin F. Smith

AUGUST, 1925 VOL. 16 No. 8

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TUMOR FORMATION IN BRYOPHYLLUM

Frontispiece

Photograph showing that one successful crowngall inoculation on *Bryophyllum calycinum* does not protect from a second inoculation. The base of the plant was inoculated with the hop strain of *Bacterium tumefaciens* March 22, 1920. The top of the plant was inoculated with the same strain of the organism on October, 3, 1921, after the lower tumor had become of large size. Photographed March 2, 1922, about one-third natural size, i. e., the height of the plant was 20 inches. At this date both tumors were still free from necrosis, the lower tumor being nearly two years old and the upper one over five months.—*Erwin F. Smith.*

INHERITANCE OF TWINNING

In a Herd of Holstein Cattle*

ROBERT H. LUSH
Kansas State Agricultural College

TWIN DAUGHTERS OF "PAUL"
Figure 1

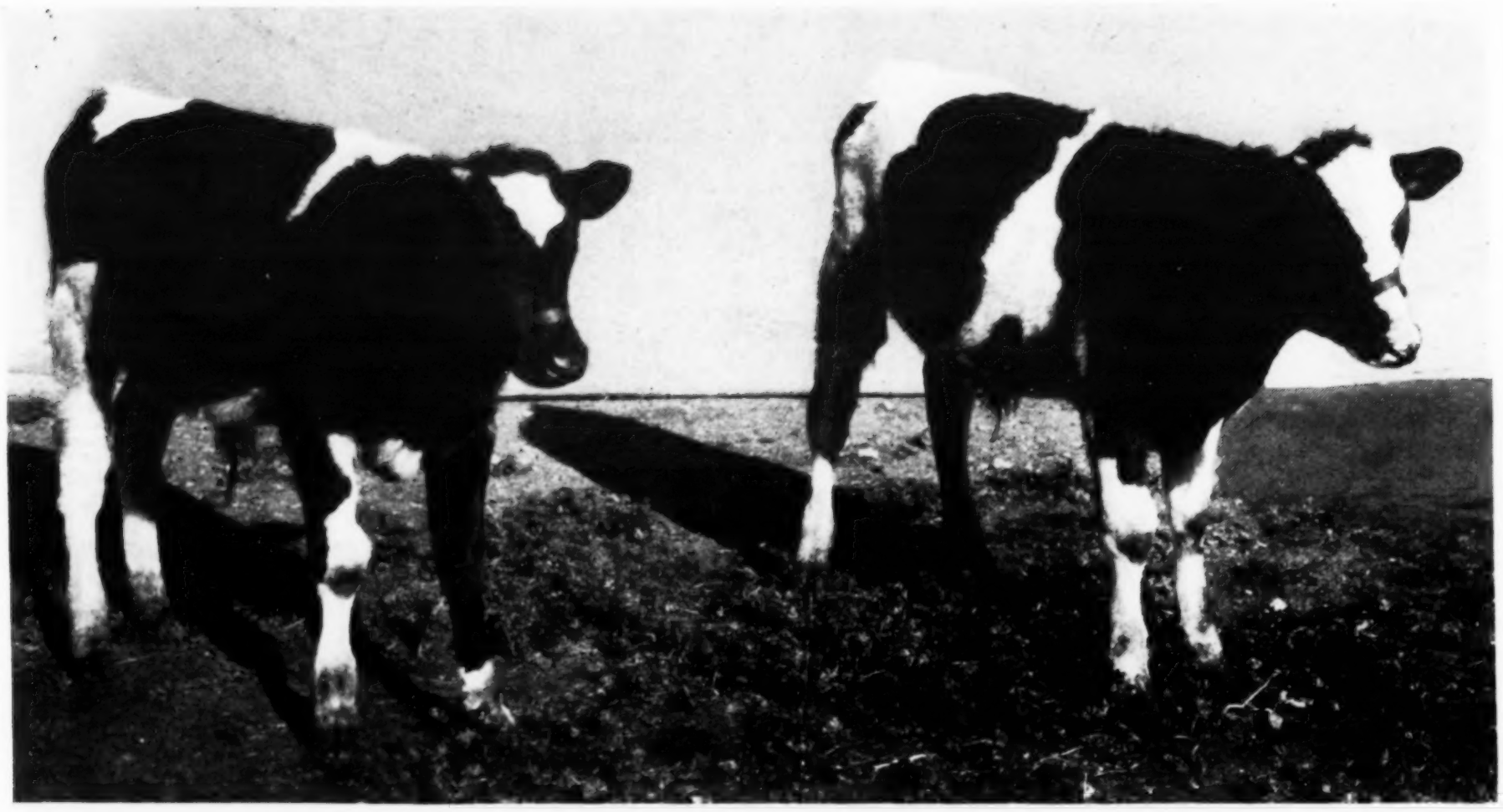
"Paul" is the sire of five pairs of twins; and another distantly related bull "Quad," sired nine pairs. It is not possible that many of these twins are monozygotic (identical), although this pair may be. They differed only one pound in birth weight, and in rate of growth and conformation they are remarkably alike. One produced only seventy-three pounds more butter fat in her first year than the other, under slightly different feed conditions.

THE mode of inheritance of twinning in man has been given much study. The tendency for twins to occur more often in certain families than in others has often been noted and charted. This paper reports an unusual amount of twinning in certain related families of Holstein cattle.

Gowen[1] states that of 2,573 births reported to him by cattle breeders there were twenty-one pairs of twins (or about 1 in 125), or less than one per cent of the calvings were twin births. White[2] lists seventeen pairs of twins in 1,300 births of dairy calves, or a twinning percentage of 1.3. The occurance at the Kansas Experiment Station of sixteen pairs of twins in 181 births among Holsteins seemed remarkable. Moreover, twelve pairs of twins were dropped in the last four and one-half years as compared with four pairs in the previous eight years for which records are available. This indicates an increased amount of twinning, out of all proportion to changes in the number of individuals considered. The increase is largely due to the number of twins sired by the bull Campus Sir Korndyke Quad.

Combining the figures of Gowan and White gives thirty-eight pairs of twins among 3,873 births or 0.98 ± 0.11 per cent. There were twenty-two pairs of twins in the Kansas Experiment Station dairy herd in only 509 births or 4.32 ± 0.61 per cent. The difference, 3.34 ± 0.62 per cent, is more than five

*Contribution No. 54, Department of Dairy Husbandry.



TWIN SONS OF "QUAD"
Figure 2

One weighed ten pounds more than the other at time of birth, and they always differed in size. It is not likely that they are monozygotic.

times its probable error, indicating that the Kansas Experiment Station dairy herd differs significantly with respect to percentage of twinnings from the average herds reported by Gowan and White.

The first step in the attempt to find the reasons for this difference was to separate the records for each breed in the Kansas Station herd. This is shown in Table I.

Here it appears that the unusual condition is due almost entirely to the records of the Holstein breed. The Jersey twinning percentage is approximately what was expected, the Ayrshire percentage deviates only a little more than its probable error, the Guernsey percentage deviates less than three times its probable error, while the Holstein twinning percentage deviates nearly sixteen times its probable error.

The second step in finding the cause of the unusual percentage of twinning among the Holsteins was to see whether the progeny of the different sires differed in percentage of twins. The data on this point are given in Table II.

The percentage of twinning (19.2 ±3.9 per cent) among the offspring of the third bull in this table, "Quad," exceeds that of the other four bulls combined (5.2±1.3 per cent) by 3.4 times the probable error of the difference (14.0±4.1 per cent). This difference is therefore probably significant. It is also true, however, that these other four bulls as a group exceed the average from Gowan and White's data by more than three times the probable error. "Quad" exceeds the latter average by 4.7 times the probable error of the difference.

The inference from Table II is that the third bull differed very much from most other bulls in some such way that he had a larger percentage of twins among his offspring than is normal and that probably the second and fourth buils also differed from most bulls in the same way, but not to the same degree. However, this inference cannot be considered as absolutely proved by the figures in Table II because these bulls were used at different times and the cows on which they were used were not exactly alike. That is, there may have been some condition

TWIN DAUGHTERS OF "QUAD"

Figure 3

They appear to be identical as they are very much alike in conformation and to some extent in color pattern. The difference in birth weight was only three pounds, and at five months of age, when this picture was taken, one weighed only eight pounds more than the other. This indicates a remarkable similarity in rate of growth.

conducive to twinning which by coincidence happened to prevail in the herd only during the time that certain sires were in use, or cows with the tendency to produce twins may have been in the herd in much larger numbers during the period when some of the bulls happened to be in use. The former possibility seems unlikely when it is remembered that the abundant twinning did not occur among the other breeds kept under the same conditions. Large progenies are not available from single matings in cattle and therefore the best way to inquire into the second possibility is to study the pedigrees of the Holstein cows and bulls which produced a high percentage of twins and also of those which produced a low percentage.

In studying the pedigrees of sires and of the dams which dropped twins, a close relationship is immediately evident. "Cronus," the first sire used, was a grandson of Hengerveld De Kol through a son, Pontiac Cronus. Pontiac Cronus is the sire of Carlotta Pontiac, who was bred to another son of Hengerveld De Kol to produce Campus Sir Korndyke Quad, the third sire listed. Thus the first sire used, "Cronus," was a grandson and the third sire is both a grandson and great-grandson of Hengerveld De Kol, a very prepotent sire and, as mentioned by Hunt[3], one that occurs frequently in the pedigrees of twins. As will be shown later, every twin calf dropped in the herd has been a direct descendant of Pontiac Cronus and Hengerveld De Kol.

TWIN DAUGHTERS OF "QUAD"—CERTAINLY NOT IDENTICAL

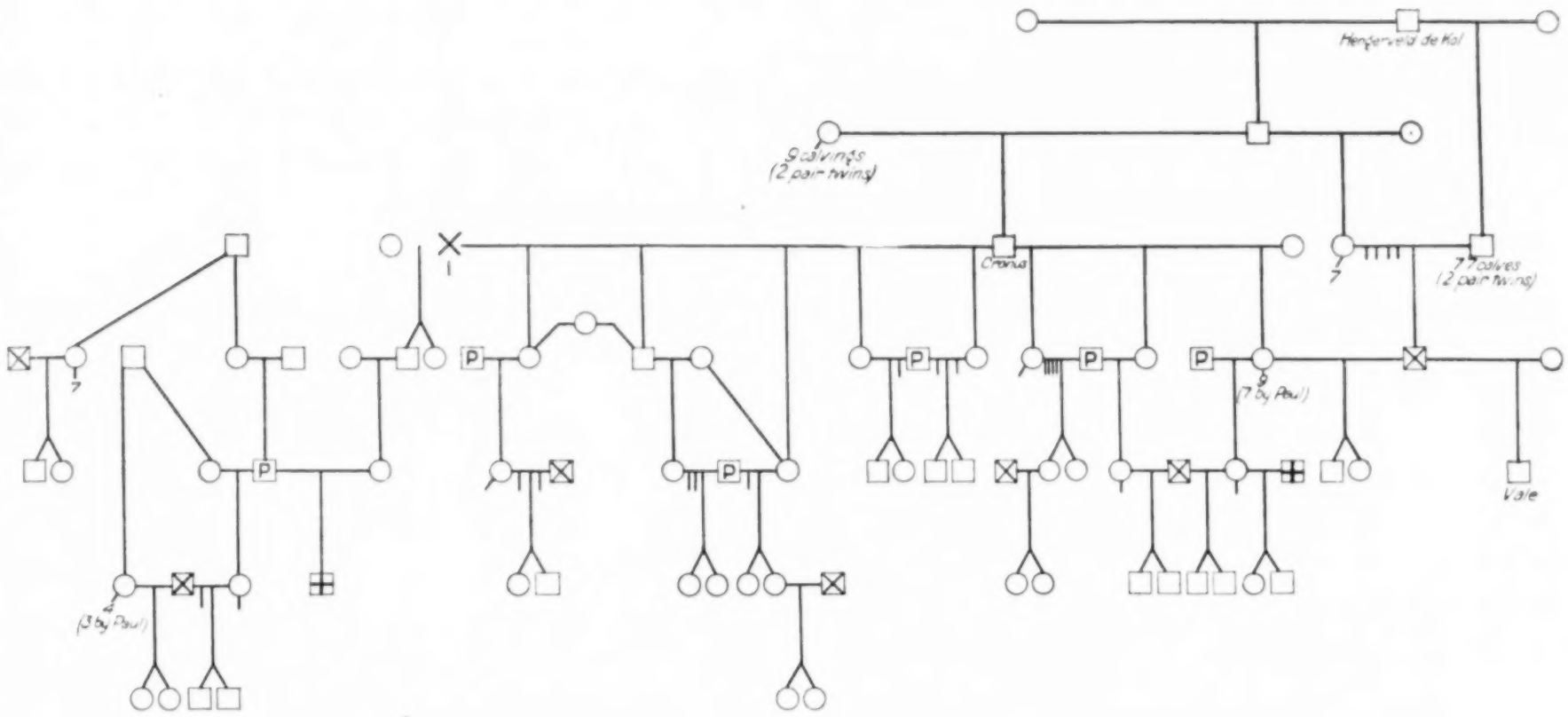
Figure 4

These twin heifers differed markedly in size, conformation, and color markings. The birth weights were eighty and ninety pounds respectively, and at eighteen months the difference in weight was more than a hundred pounds.

Of the other sires used, the second one, "Paul," was not related to the first or third, but sired the fourth herd sire when mated to a granddaughter of "Cronus." The fifth sire is a son of "Quad" from an outside dam. Figure 5 shows the relationship of the various sires and of the dams which dropped twins.

So far only the sires of twins have been mentioned. Embryologically it would appear that the dam determines single or multiple birth unless we assume that some twins are monozygotic, in which case the sire might be of equal importance. Of the sixteen pairs of twins there were six of opposite sexes, which reduces the chances of monozygotic twins to a negligible factor, although three pairs of twins are so nearly alike in conformation that they may have been monozygotic. Davenport[4] gives data on human twinning which indicate that the tendency to twin production is hereditary and that not only the mothers but also the fathers have great influence in determining the production of twins. He suggests that two ova may be produced more often than usually assumed and that the sperm of certain males may be especially active and alert or free from lethal factors which might cause the death of one embryo. The breeding of the dams which calved twins is interesting but not statistically significant. Of the nine cows bred to "Quad" which produced twins, six are daughters of "Paul," a bull in no way related. However, of these six daughters of "Paul," five are granddaughters of "Cronus" and the other is a granddaughter of Walker Copia Champion, the sire of Inka, who is the dam of twins by "Quad." A daughter of the grandsire of "Paul" produced twins when mated with "Quad" and the other pair were from a daughter of "Cronus."

As previously shown, "Paul" sired five pairs of twins, the dams of four being daughters and one a granddaughter of "Cronus." "Paul" has one son, C. P. Emperor, who is a grandson through the dam of a twin son of "Cronus." When C. P. Emperor was bred to a granddaughter of "Cronus" which had previously calved twins by "Quad," she again calved twins. This is the only case in the Holstein herd of a cow twinning twice. Thus of the fifteen dams which dropped twins, five



RELATIONSHIP CHART OF TWIN-BEARING STRAIN

Figure 5

Of the fifteen dams of twins shown in this chart only three were not related to "Cronus," a grandson of Hengerfeld de Kol. "Quad," the sire of nine pairs of twins, is especially rich in the blood of Hengerfeld de Kol, who appears frequently in the ancestry on twins.

are daughters and seven are granddaughters of the first sire, "Cronus." The other three dams are not related, but were bred to descendants of "Cronus" and twinned. Thus every pair of twins dropped has Pontiac Cronus as either great-grandsire or as great-great-grandsire and the pedigrees of seven pairs of twins show Pontiac Cronus on both the sire's and the dam's side.

In Table III an attempt is made to summarize the results from the different types of matings.

Table III shows clearly a greater amount of twinning in the dams descended from "Cronus," but an even greater difference in favor of the one sire, "Quad," over the other sire, "Paul." The relationship of "Paul" to the dams that were bred to "Quad" might appear significant, but can be explained by the fact that nearly all were also descendants of "Cronus." The probable error of the difference between the above groups of dams mated to the same sire either differs but little or is greater than the difference itself, so that no significance can be attached to these differences.

There are two interesting points not shown in Table III that tend to show further that the sire is partially responsible for twinning. "Quad" was bred to six daughters of "Paul" nine times, with six pairs of twins resulting. However, these six dams were bred fourteen times to other sires without producing twins. And "Quad" was mated four times to three cows unrelated to "Cronus," with three pairs of twins resulting. These same three cows, however, produced twelve single calves by other sires. These cases strengthen the supposition that the sire may exert considerable influence in causing multiple births.

Moreover, in two cases, one of a pair of twin heifers has produced twin heifers when bred to "Quad." One case is worthy of special mention. Mattie Wayne De Kol had two daughters, one a daughter and the other a granddaughter of "Cronus," each of which calved a pair of twin heifers

from the services of "Paul." These four twin heifers have each calved twice and one dropped twin heifers by "Quad."

So far only the blood lines of the parents have been considered. Gowen[3] suggests that young sires may produce more twin offspring than those over four years of age. "Quad" sired five pairs of twins in his first three years of service and four pairs in the next three years. Of the sixteen pairs of twins, seven were sired by bulls of less than four years of age. The number of cows served was about equal for both ages and it is not likely that the age of the dams would have any influence on twinning.

Neither does the season of year in which the twins were dropped have any significant relation, but the large number of twins in the summer is interesting in a herd with an even distribution of calving throughout the year. Eight pairs of twins were dropped during the four summer months.

It has been suggested that high fertility is usually associated with high production. The average production of the ten dams of twins that have Advanced Registry records is 14,980 pounds of milk and 503 pounds of butterfat as compared to 14,259 pounds of milk and 475 pounds of butterfat for all other Holstein dams in the herd with Advanced Registry records. The average difference between the two groups is slight, while the variation in production follows such a wide range that it is difficult to say that high fertility is generally associated with high production.

Summary

1. From the data available from two sources it appears that twins occur in .98 per cent of the births of dairy cattle.

2. Twins occur more frequently in the Holstein breed than in other dairy breeds at the Kansas Experiment Station. The twinning percentage of this herd is 8.84 per cent, or nearly five times as high as for the other dairy breeds in this herd and nine times as high as for the dairy cows in the total of figures given by Gowen and by White.

3. There is a tendency for twinning to occur more often in certain families than others. One out of every five cows bred to a certain sire produced twins. The bringing together of the hereditary factors for twinning of Hengerveld De Kol in this sire is probably responsible for most of the twinning.

4. The influence of the breeding of the dams is noticeable in the production of twins, but is not so important as that of the sire.

5. The age of sire and of dams, season of year, and producing ability of dams appear to be negligible factors in the production of twins.

6. On account of the smallness of the progenies from individual matings, it was not possible to identify the factors responsible for twinning in these cases, nor even to establish that these factors were Mendelian. However, the observed facts agree with the hypothesis that these factors are distributed in a Mendelian manner.

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TABLE I.—Twins in Dairy Breeds

Breed	*No. of Sires*	*No. of Dams*	*No. of Male Calves*	*No. of Female Calves*	*Pairs Twins*	*Twinning Percentage*
Holstein	5	47	93	104	16	8.84±1.42
Ayrshire	5	40	53	72	2	1.62±0.77
Guernsey	5	36	55	56	3	2.78±1.07
Jersey	7	27	58	40	1	1.03±0.69
Total	22	150	259	272	22	4.32

TABLE II.—Twins of Each Sire

Sire	*Bulls*	*Heifers*	*Total*	*Pairs Twins*	*Twinning Percentage*
Sir Carlotta Pontiac Cronus	15	23	38	1	2.7 ±1.79
Canary Paul Fobes Homestead	40	43	83	5	6.41±1.87
Campus Sir Korndyke Quad	28	28	56	9	19.15±3.87
C. P. Emperor	8	7	15	1	7.1 ±4.63
K. S. A. C. Vale	2	3	5	....	.....
Total	93	104	197	16	8.84±1.19

TABLE III.—Percentage of Twins from Different Matings

Breeding of Dams	MATED TO PAUL			MATED TO QUAD		
	No. of Dams	*Times of Calving*	*Twinning Percentage*	*No. of Dams*	*Times of Calving*	*Twinning Percentage*
Dams Related to Cronus	31	56	7.1±2.3	21	32	21.8 ±4.9
Dams Unrelated to Cronus	11	22	4.5±3.0	10	15	13.33±5.9
Dams Related to Paul	....	....	.....	21	30	20. ±4.9
Dams Unrelated to Paul	....	....	.....	11	17	17.65±6.2
Daughters of Cronus	....	....	.....	2	2	50.
Granddaughters of Cronus	....	....	.....	16	26	19.23±5.2
Great-Granddaughters of Cronus	....	....	.....	5	5	20.

Urbanism Viewed by Thomas Jefferson

I CONGRATULATE you on the healthiness of your city [Philadelphia]. Still Baltimore, Norfolk and Providence admonish us that we are not clear of our new scorge [yellow fever]. When great evils happen, I am in the habit of looking out for what good may arise from them as consolations to us, and Providence has in fact so established the order of things, as that most evils are the means of producing some good. The yellow fever will discourage the growth of great cities in our nation, and I view great cities as pestilential to the morals, the health and the liberties of man. True, they nourish some of the elegant arts, but the useful ones can thrive elsewhere, and less perfection in the others, with more health, virtue and freedom, would be my choice.

Although we have in the old countries of Europe the lesson of their experience to warn us, yet I am not satisfied we shall have the firmness and wisdom to profit by it. The general desire of men to live by their heads rather than their hands, and the strong allurements of great cities to those who have any turn for dissipation, threaten to make them here, as in Europe, the sinks of voluntary misery. . .

The inhabitants of the commercial cities are as different in sentiment and character from the country people as any two distinct nations. . . .

As yet our manufacturers are as much at their ease, as independent and moral as our agricultural inhabitants, and they will continue so as long as there are vacant lands for them to resort to; because whenever it shall be attempted by the other classes to reduce them to the minimum of subsistence, they will quit their trades and go to laboring the earth. A first question is, whether it is desirable for us to receive at present the dissolute and demoralized handicraftsmen of the old cities of Europe? A second and more difficult one is, when even good handicraftsmen arrive here, is it better for them to set up their trade, or go to the culture of the earth. Whether their labor in their trade is worth more than their labor on the soil, increased by the creative energies of the earth?—*Letters and Addresses of Thomas Jefferson.*

The Family Genealogy

FAMILIENBUCH: Anleitungen und Vordrucke zur Herstellung einer Familiengeschickte. By DR. WALTER SCHEIDT, Privatdozent for anthropology in the University of Hamburg. J. F. Lehmanns Verlag, Munich, 1925, price $2.50.

Dr. Scheidt has prepared a simple but comprehensive book for the keeping of family records. Space is provided for historical data, for measurements and other essentials of a personal description, and for photographs. Clear and concise directions are given for use. The publishers have given the book a beautiful make-up, worthy of the subject.

P. P.

THE MULATTO PROBLEM

ERNEST DODGE, *Washington, D. C.*

THE numerous races and subraces of mankind could hardly have maintained their distinct existence to so late a date in history save for the geographical barrier generally found between different stocks. The only other bulwarks against amalgamation are artificial caste distinctions and such degree of mutual repulsion or lessened attraction as may exist when racial characteristics differ in the extreme.

Whenever and wherever the one dependable barrier of geographic separation between two radically different types is swept away, it should be the business of Eugenics to investigate the biological results of crossing. If these prove to be beneficial or even neutral, then artificial walls of caste should be discouraged, as these are always inconvenient and may become intolerable. But if the results of amalgamation are found to be markedly injurious, then eugenic research will not only strengthen the force of social inhibition but lift it from the plane of mere prejudice or pride to the level of an ethical mandate.

In the United States a problem exists which demands extensive and impartial eugenic research, but which unfortunately has never received it on any adequate scale. Nine-tenths of our population are a heterogeneous mixture of many European races which collectively we call by the misnomer of "Caucasian." The other one-tenth belong to a type so different and so prepotent for perpetuating their differences in mixed offspring, that present-day sentiment is strongly crystalized against amalgamation of the two populations.

We should err, however, if we assumed that caste barriers now existent will certainly prove effective for keeping black and white America distinct throughout all centuries to come. Past history would point to a different expectation. Probably one in five of the Afro-American people has enough of the Caucasian in his make-up to be noticed by an observer, while doubtless many considered to be full blacks have one-eighth or one-sixteenth part of white ancestry.

True it is that the major part of this influx of white blood occurred a considerable time ago, having been tolerated by a sort of patriarchal moral code under slavery and in the earlier years after emancipation. Improvement in education, economic condition, and racial self respect has doubtless reduced the number of colored mothers willing to consent to extra-legal unions; and the sentiment also of the majority race is probably less tolerant than formerly toward such alliances. As for legal intermarriage, it has always been too infrequent to be the leading factor in the problem.

But the saying is a true one that "you can't un-scramble eggs." Unless it should be a fact that the children and grandchildren of mulattoes are inferior to pure negroes in fertility and viability, the composite complexion of the Afro-American community must inevitably grow lighter as the centuries succeed one another. For it cannot be expected that the interbreeding of two contiguous populations will ever be reduced to zero. And every child that shall ever be born of a mixed union increases permanently the percentage of European blood in the colored population. The process might indeed be slow, but it could work in only one direction.

It becomes, therefore, a matter of real importance to learn what the ul-

timate results of past or future intermingling will be. The present article is meant in part as a plea for the endowment of scientific research in ways that will be indicated before we close.

Is There a Biological Problem?

It may be objected by some that there is no field for such research, no real unsolved problem. And as to superficial features it may be admitted that the facts in a measure speak for themselves. Everyday observation proves that color of the skin and the crinkly texture of the hair do not follow any simple Mendelian law, but rather show a progessive (though not always uniform or predictable) dilution under repeated crossings with the white. The typically broad and flat African nose, on the other hand, has some of the marks of a recessive Mendelian character; for it is supplanted by the European form of nose in many even very dark persons of mixed blood, yet occasionally with a man or woman of light yellow complexion the African type of this feature crops out in even exaggerated form.

Also common observation proves that there is little foundation for the popular alarm over the possible consequences if a quintroon should conceal his race and pass for white. Numerous persons have done this and their posterity been none the wiser. The dreaded "throw back" to a pronounced negroid type in the offspring exists largely in fiction. If a genuine case ever occurred it should be an outcropping of a long buried recessive trait, and this would be taken to prove that *both* parents, and not one alone, had a hidden and possibly forgotten trace of negro blood in their makeup.

But the research for which a plea is here made does not refer to obvious matters like the foregoing. It is to be aimed at something deeper. One of its main objectives is to learn whether the mixed race will ultimately tend to die out, on the one hand, or to multiply and overshadow the pure races. The other line of inquiry is to ask how the products of racial mixture compare in moral qualities, in intelligence, inventiveness, and industrial efficiency with the two parent stocks on either side of them.

If there are any who claim that for practical purposes there is no biological problem but only a social problem, let us remind them that biological laws will continue unchanged for the next thousand years; but social conventions, valid for their own day, are ever shifting in adaptation to new conditions.

And as to the incompleteness of our present knowledge, a question certainly is not yet settled so long as intelligent people with equal opportunities for knowing the truth proclaim widely different conclusions. There are those who maintain that mulattoes are inferior physically and morally to either pure race. There are others who say that they are superior to blacks but inferior to whites. And there are some, at least among the mulatto population itself, who maintain they are in no way inferior to whites except in the present visible results of past opportunities. Now those at either extreme may be mistaken through overlooking essential factors in the situation. Those who urge that mulattoes are at least superior to blacks may be neglecting the biologic law that the first filial generation often shows increased tone and vigor while later posterity of these same crosses may show degeneration. Also they may overlook the social fact that mulattoes—welcomed as house maids, barbers, waiters, Pullman porters, janitors, and the like—have had greater opportunities than negroes to improve their economic condition, to acquire education, and to live in sanitary surroundings. But on the other hand it is just as conceivable that those who declare mulattoes inferior to whites are overlooking important factors.

They may underestimate the handicaps under which all colored people are laboring, with laws for compulsory segregation, with many doors of opportunity closed in their faces, and with the psychic factor of discouragement that comes from being classed as "niggers" and "inferiors." Also they may forget that it was not always the best of either race who contributed to the mixed offspring.

Manifestly, then, there is a problem. And the problem is not merely a social one.

Future Tendencies

Now if we try to build up a guess as to what racial types will be present in America two hundred or five hundred or a thousand years hence, and what their relative proportions will be, we see this is partly dependent on what the biological laws—at present largely unknown—really are, and partly is conditioned by future developments in racial ideals and practices. On the biologic side it may prove true: (a) that the grafting of white blood on the negro stock increases its fertility, its adaptability to cold climate, and its capacity to win economic success in our modern environment. Or study might show (b) a directly opposite result; or (c) a result practically neutral.

Then parallel to these biologic alternatives, (a) (b) (c), we must note four possible treatments of the race problem by the caste arrangements of society. These we shall denote by Roman numerals.

(I) An almost impassible barrier may be established between all "whites" on the one hand and all "colored" on the other. But among the colored themselves the mulattoes, quadroons, and octoroons may gradually intermarry with the blacks, so that after a few generations practically all colored people will be apparent blacks, with an imperceptibly small percentage of white blood.

(II.) But beside the caste barrier separating white from colored, the colored people themselves might divide into two (or possibly even three) social strata, between whom intermarriage will become as completely tabooed as between the "white" and the "colored." If such multiple barriers were maintained for three or four generations, those in any one compartment between two barriers would become nearly homogeneous in blood, thus making the caste cleavage more distinct. Assuming a three-fold division there could be a brunette octoroon caste; a deep yellow mulatto-like caste with perhaps three-eighths African blood;* and a black caste, practically uncontaminated by white inter-mixture. The present state of colored society is a hesitant compromise between drifting toward (I.) and crystalizing toward condition (II.) Light colored persons in a large majority of cases choose to intermarry among themselves. Yet the intermarriage of light and dark colored people is by no means wholly tabooed. And white society is exerting an influence which unintentionally is pressing in both directions. By insisting on segregation in church, school, theater, restaurant, railway station, and at the marriage altar, it is tending to develop a sense of solidarity in the whole colored population. At the same time by opening certain economic and quasi-social opportunities to quadroons and mulattoes as distinct from blacks it is exerting an influence toward stratification within the race.

(III.) If the next several generations should establish a definite four-caste system in America, like (II.) above outlined, then it is conceivable that later generations would see the gradual breakdown of the caste wall between octoroons and whites, a wall

*If color or other characters should prove to be inherited in Mendelian fashion, with multiple factors involved, these hybrid casts might never approach uniformity, thus making such barriers difficult to maintain.—*Editor.*

that is really a comparatively new thing in our land. In Virginia before the Civil War a free person with not more than one-eighth African blood was white before the law, could vote and could legally intermarry with whites. In the last analysis the thing which today prevents white men in northern states from taking octoroon wives with the same freedom as brunettes of other origin is not that their children will be quintroons, but the possibility that their brothers-in-law and sons-in-law might be negroes, their nephews and grandchildren mulattoes. Once let those who are but slightly colored erect a firm social wall between themselves and the real Africans, and there would not be wanting a mutual attraction tending to melt down the wall between them and the whites. The final result would be that one of the four castes assumed under social arrangement (II.) would disappear. Thereafter among the whites the presence or absence of an exceedingly remote trace of African lineage would become of no more social importance than a trace of Indian blood today.

(IV.) There is one final possibility that must be reckoned with, though it is contrary to all prevailing ideals. That is that race and caste barriers may sometime in the long centuries be quite swept away and the entire American people become a race of quintroons. Such a thing will not come about by any cataclismic break in existing customs. But the foregoing discussion points the way to its final possibility—unless eugenic researches should prove such a result to be so radically undesirable that society would erect against miscegenation a bulwark of caste thrice stronger even than now.

For we must consider that the influx of new white blood into the colored population, though no doubt smaller in volume now than formerly, has by no means wholly ceased. It is conceivable that the whole negro population might in some future century become so far "bleached" that white society would begin to feel toward it somewhat as it feels toward the American Indian today. Then time, caprice of the mating instinct, and the inconvenience of a rigid caste cleavage, might eventually do the rest.

Need For Investigation

Is not this enough to show that there is a problem for investigation? To illustrate how many ramifications there are to the problem, notice that if we link up the four social arrangements previously discussed, with the three biologic possibilities, we get twelve combinations, twelve different pictures of America's ultimate racial structure. To discuss these each by itself is beyond the limits of an article like this. We should merely note that such data as might be brought to light by skillful research would be of practical importance in shaping the conduct and ideals of both races.

They would indeed have a very lively and present interest to Afro-Americans of mixed race. These, in looking forward to coming generations of their own posterity, are compelled to turn their eyes in three directions—toward possible further alliances with the whites, whose blood is already strong in their veins; toward losing their present type and status through back crosses with their black brothers; and lastly, toward the difficult alternative of loosening the social and political ties between themselves and the true negroes, winning the animosity of the latter as deserters, and finally making themselves into a definite and rather lonely intermediate caste.

And then as for the white race: if impartial research should conceivably prove that even the smallest admixture of colored blood is a pronounced racial handicap, lessening the mental processes, the moral fiber, fecundity and the resistance to disease, then it would

become a duty to the future to maintain and further strengthen at any cost all barriers against amalgamation. But if, on the other hand, the most careful research should indicate that the results of an ultimate "quintroonifying" of America would be at the utmost no worse than neutral, then would our people be justified in ceasing to worry about the future and in letting each coming generation handle its own caste problem with whatever degree of laxity or vigor shall best suit its own predilections, immediate conditions, or conscience.

Methods of Investigation

Now if there is ever going to be any real scientific research into the results of almagamation, it needs to be undertaken as soon as possible. For the facts which are to be gathered are more readily available today than they will be ten or twenty or forty years hence. The data which must be sought are even now difficult to obtain, possible to obtain for only a small minority of the people. And a generation later the possibility would be less, since the primary facts as to where mixed lines of descent originated will have been more generally forgotten.

Many a man, that is to say, can tell from his own memory a great deal of importance regarding all four of his grandparents, their physical features, modes of thought and modes of life, their general caliber as human beings; but it is rare for one to possess authentic information even by tradition as to all eight of his great-grandparents, and unprecedented to speak with accuracy of his sixteen progenitors in the fourth ancestral degree. Yet the thing which we need for a scientific study of the mulatto problem is to know exactly how much white blood has been mingled with the Afric inheritance of a given family, when and where the influx occurred, and especially just where the several ancestors both white and black stood in the physical, mental, moral, and social scale. We need also to know the economic and social environment of the intermediate generations, as affecting longevity, fertility, and the like. Furthermore, we need to trace if possible in collateral lines some pure white and pure black first and second cousins to form a basis of comparison. But since in the great majority of quadroon or mulatto families the racial mixture first began not later than the grandparents or great-grandparents of those now living, the delay of another generation will put those origins in most cases quite beyond the reach of inquiry.

Of course a proposition for extended research into this field will seem chimerical to many, and for various reasons. Some will say that the inquiry is unnecessary since we already know what the results of black and white miscegenation are. This has already been answered by showing that those who think there is no problem are not agreed as to the facts. In the pages of this magazine within the past year directly opposite views have been maintained. Others will object that the inquiry is irrelevant, since no matter what the biological verdict might be, the social reasons forbidding miscegenation are absolutely controlling. Unfortunately for this contention, the mingling of blood is an extensive present fact, and a fact (as hereinbefore demonstrated) that may tend to increase as century follows century.

Finally, and most reasonably, many will object that the inquiry must be hopeless, that the biological factors are so complicated by human freedom of action and by social, economic and moral factors, that no dependable conclusion could ever be drawn from data that might be gathered. Within limits the objection is valid. But it is not the way of science to let an important problem alone merely because of its difficulty. If complete data are admittedly unattainable, some pertinent facts can be saved from oblivion if they are methodically sought for before it is too late. The work of the

first twenty or forty years must be chiefly the seeking and recording of facts. Their interpretation in any convincing way will be impossible until the body of verified data becomes rather large.

As to concrete methods, the appeal should be broadcasted to well-endowed institutes of research until one of them shall decide to underwrite an inquiry into this important field. When some responsible society has taken up the idea, a corps of competent investigators must be recruited and specially trained for the task. Then they must set to work rather quietly among the Americans of mixed blood. When a family is found that has a complete tradition as to its origin it must be tactfully approached with searching inquiries. And the assurance given that answers will be held in sacred confidence except for statistical averages or for family trees that will be quite anonymous if published. Many of these investigators will have to be recruited from among educated mulattoes and quadroons as these will have access to the confidence of their fellows which it will be difficult for a white scientist to win. But the staff of the institute must also include white geneticists and sociologists, to assist in guiding the research and to insure that the inquiry shall not take on a bias from predilections or pride on the part of the class which is the subject of inquiry.

Is there an institute, academy, or individual philanthropist that will stand sponsor for this important human study?

An Outline of Evolution

DIE ABSTAMMUNGSLEHRE, Tatsachen, Theorien, Einwaende, und Folgerungen in kurzer Darstellung, by LUDWIG PLATE, professor of zoology at the University of Jena. Pp. 172, with 94 illustrations, price $1.50. Jena, Verlag von Gustav Fischer, 1925.

This book is a revised edition of Dr. Plate's *Leitfaden der Deszendenztheorie*. It gives a good picture of the argument for evolution, along the classical lines (paleontology, morphology, and so on); and deals specifically with many criticisms and misunderstandings.

In contrast to the Neo-Darwinians (A. Weismann et al.) the author describes himself as an Old Darwinian; i. e., he accepts Lamarckian ideas as valid, just as Charles Darwin did, although considering natural selection to be perhaps more important than the effects of use and disuse.

In a brief chapter on the application of evolutionary conceptions to society, Dr. Plate shows some leanings toward militarism and anti-semitism. *P. P.*

A Primer of Eugenics

DIE ERBLICHKEITSFORSCHUNG UND DIE WIEDERGEBURT VON FAMILIE UND VOLK, by HERMANN MUCKERMANN, S. J., 3d. ed., p. 22, price 15c. Freiburg im Bressgau, Herder & Co., 1922 (B. Herder Book Co., St. Louis, Mo.).

This little pamphlet by a Jesuit biologist is an excellent presentation of eugenics from a biological point of view. It has had a wide circulation, and deserves it.

P. P.

IMMIGRATION AND EUGENICS

Second Report of the Sub-Committee on Selective Immigration of the Eugenics Committee of the United States of America

The following reports have recently been released for publication by the sub-committee on Selective Immigration of the Eugenics Society of the United States of America. If amendments to the present law are proposed in the next session of Congress these reports will undoubtedly be featured in the discussion. It is therefore though desirable to publish them in full, so that the members of the American Genetic Association will be well advised as to their contents.

Immigration is such a moot subject that the findings of this committee will hardly be accepted *in toto* by very many people. We would be especially glad to receive criticisms and suggestions from the members of the American Genetic Association. Should these be sufficiently numerous it may be deemed advisable to devote part of a number, or even an entire number of the *Journal* to a discussion of the subject.—*Editor.*

THE Immigation Act of 1924 established a new American immigration policy. It expressed the conviction of the American people that "immigration is a long-time investment in family stocks rather than a short-time investment in productive labor;" that it is a question of future race character, and not primarily an economic problem.

Only a limited number of new aliens are to be admitted, and the bulk of these are to be of the same racial stocks as those which originally settled and developed the country, founded its institutions, framed its constitution and today still make up the bulk of its population. The important step of numerical limitation has been taken. It now becomes our duty, both to ourselves and to coming generations of Americans of whatever racial origin, to set higher mental and physical standards for all our future immigrants. It is an absolutely illogical and indefensible situation that our regulations governing the admissions of animals and plants are today, and have been for years, far more stringent than our immigration laws, and have been more strictly enforced.

Although the Immigration Act of 1924 contains no specific provisions looking toward a more rigid exclusion of eugenically undesirable aliens, it is accomplishing a better selection than has hitherto been possible. It embodies the first real attempt which the United States has ever made to conduct a preliminary selection abroad. Under the new law, a consular officer may refuse to issue an immigration visa, "if he knows or has reason to believe that the immigrant is inadmissible to the United States under the immigration laws." While the new plan involves a large amount of paper work, and while there will surely be many cases of perjury and of fraud, many aliens who have been declared excludable for eugenical or other reasons can be headed off by our consuls when application is made. This plan reduces hardships by saving many nationals of other countries the expense of the ocean trip to the United States only to find that for some reason the immigrant, or some member of his family, cannot enter. Certificates are issued only up to the numbers allowed by the quotas, and are good for four months, so that if an alien comes at any time within that period he will not be denied admission as being in excess of the quota allowance. This provision also stops the rush of aliens at the beginning of each month and at the end of the year, and makes possible a much more deliberate and more thorough medical inspection at our ports.

There is room for improvement, however, in the medical inspection of aliens who come in other classes than the steerage. It seems clear that many eugenically and otherwise undesirable aliens are trying to escape rigid medical examination by travelling second, or even first class.

Two other clauses in the Act of 1924 deserve mention because of their eugenical importance: (1) The fines on the transportation companies for bringing inadmissible aliens are considerably increased, and this should greatly help in the enforcement of the law; (2) alien seamen must be detained on board ship until they have submitted to inspection, including a medical examination. With certain exceptions, alien seamen found excludable are prohibited from landing.

The new law is thus a step forward along eugenical lines.

The Sub-Committee on Selective Immigration unanimously supports this law, which should be maintained and strengthened in such respects as experience in practice shall indicate to be necessary for the fulfilment of its fundamental purposes. The extension of quota limitations to the countries of the Western Hemisphere is both logical and necessary. To break down our present law in order to admit more "labor" would undermine its fundamental purposes and put immigration back on a purely economic basis.

Why Eugenically Undesirable Aliens Have Not Been More Effectively Excluded

The general Immigration Act of 1917 enumerates all the classes of aliens—about a dozen in all—which Congress has so far declared shall be excluded because undesirable for physical or mental reasons. In respect to these classes, this earlier Act remains in force, not having been superseded by the new Act of 1924.

The Act of 1917 has, however, by no means accomplished the complete exclusion of the diseased; of those mentally and physically below par, or of those with criminal records and tendencies.

This situation has been due chiefly to three conditions: (1) the lack of enough well-paid and thoroughly competent inspectors; (2) the impossibility of detecting, in the hurried examination at the port of arrival, nearly all the cases which for one reason or another should be debarred; (3) too great leniency both in sustaining appeals from adverse decisions of competent medical and general immigration inspectors, and also in admitting certain classes of aliens on bonds.

The decrease in numbers of immigrants resulting from the new Immigration Act of 1924 has made possible a much more thorough examination. The difficulties noted under (1) and (2) have, therefore, already been lessened. As to the third difficulty, the appeal and bonding clauses of the Act of 1917 give the Secretary of Labor authority to reverse the decisions of the boards of special inquiry, and also to permit aliens suffering from certain diseases or disabilities, or likely to become public charges, to enter the United States for a limited time, under bonds, for treatment, or to give them opportunity to prove that they will not become public charges. In theory, this is a just and humane provision, but under it many aliens certified by thoroughly competent medical officers as having such mental or physical defects as constitute them potential public charges and highly undesirable elements in our population have in the past been admitted to the United States. (1) Obviously, no immigrants suffering from idiocy, insanity, imbecility, feeble-mindedness, epilepsy, constitutional psychopathic inferiority, chronic alcoholism, tuberculosis or from any loathsome or dangerous contagious disease should be admitted at all. (2) The admission of any aliens who are not *clearly* and *beyond question* en-

titled to land—border-line cases—should be guarded against with the utmost vigilance. (3) No physically, mentally or morally unfit aliens should ever be admitted on bonds. To permit such persons to come in under bonds does not make them any more desirable as members of the community. American public opinion should realize that various "interests" and "influences," and political pressure, are constantly active in the effort to secure the admission of immigrants whom Congress has declared inadmissible.

Registration of Aliens

With the increasing restrictions which have been put upon immigration, the smuggling and surreptitious entry of aliens across the Canadian and Mexican borders and by sea have naturally enormously increased. While many of these "bootleg" immigrants are probably mentally and physically up to the very low standards which we have set, the majority doubtless belong to the diseased and defective classes who should most rigidly be excluded. Secretary of Labor Davis advocates registration as an effective way of outwitting the border-jumper and the smuggled alien. Under this plan every alien would be required to register or enroll annually. Failure to register to be punishable by fine. Registration would be carried out under the auspices of the Department of Labor. A final check-up of aliens who failed to comply with the law would occur when an alien applied for his citizenship papers.

Aliens legally admitted to the United States under the (1924) law must surrender to the Government all the papers which they brought with them, such as their passport, birth certificate, etc. Further, inasmuch as the law now places upon the alien the burden of proof as to his right to be here, he should surely have the evidence of this right which a preliminary registration on landing would give him. Such registration would in fact be a receipt for the papers which he surrendered on his admission a legitimate and obvious protection to him throughout the time until he becomes an American citizen. This plan would not only help in the work of assimilation and education and as an important step toward naturalization, but, what is of even more importance, it would reveal the presence of criminals, diseased, defective and other illegal entrants. If our laws against undesirable immigration are to be effective, registration of all aliens is a necessity. Furthermore, by bringing the newly-arrived alien regularly into contact with our government authorities, in the process of annual registration, we should be protecting him against those of his own nationality, already here, who are always ready to take advantage of his ignorance to exploit him for their own gain. Registration would thus be a simple act of Christian charity.

The requirements of registration would greatly simplify the process of Americanization and naturalization. There is no hardship or indignity in this for any alien who is rightly here. The objection to the plan comes chiefly from those who get rich by smuggling in illegal immigrants and from the aliens already here who live by exploiting their more recently arrived fellow countrymen.

This Committee heartily endorses a registration plan, and urges upon Congress the early enactment of legislation to that end.

Deportation of Insane and Otherwise Eugenically Undesirable Aliens

The present time limit of five years for deportation in the cases of all aliens who at the time of entry were members of one or more of the classes excluded by law from admission should be removed, and such a change in the law should be retroactive, so that any such aliens should be deportable, whether in an institution or

ANNUAL IMMIGRATION QUOTAS—1924 AND 19

Figure 6

Immigration quotas for 1924 are shown in the upper figures in each case. The lower f[illegible]es s in effect during 1925. According to the provisions of this law the number admitted annually fro admitted in 1890. Consequently immigration from Northern and Western Europe is much less Europe. Compiled by the *Journal of Heredity* from maps and tables published in the *Monthly Labo* for September, 1924, and for March, 1925.

AND 1925

...es show the quotas fixed by the Immigration Law ...ually from each country is determined by the number ...uch less restricted than that from Southern and Eastern ...thly Labor Review (United States Department of Labor)

not, and whether a public charge or not, irrespective of the time during which they have been in the United States. This provision should specifically include any alien "who, from causes not affirmatively shown to have arisen subsequent to entry into the United States, is an idiot, imbecile, feeble-minded person, epileptic, insane person, person of constitutional psychopathic inferiority, or person with chronic alcoholism," as well as all aliens who have become public charges from causes not affirmatively shown to have arisen subsequent to their entry into the United States, and also all aliens who have secured entry illegally. The Deportation Bill which passed the House of Representatives on February 10, 1925, by a vote of 213 to 39, included these provisions but unfortunately did not become law.

The warrant of arrest in all these cases should be issued by the Commissioner of Immigration or other responsible officer of the district in which the alien is a resident, instead of being issued by the Department in Washington, and the Secretary of Labor should be directed in all cases where it is intended to cancel a warrant, or to suspend deportation, to give the officer issuing a certificate an opportunity to be heard, either in person or by letter, before final action is taken.

It is impossible to estimate the value of the changes here recommended. They would mean that a large number of aliens now in our hospitals who have gone beyond the deportable period could be deported. A large amount of money ordinarily paid for repatriation purposes would be saved. This change in the law would also prevent collusion on the part of the alien's friends and interested parties in placing aliens otherwise deportable in a private institution, there to remain only until they are in the country past the deportable period, and later placed as public charges in a State hospital. This is now being constantly done.

The issuance of a warrant of arrest by the local authorities is a matter of great importance, because it permits the one who has specific knowledge of the case to decide, rather than an official in Washington, or a department clerk under him. The cancellation of warrants and the stay of proceedings without giving hearing to an individual issuing a certificate has for years been a crying evil.

Medical Inspection to be made during the Voyage

The impossibility of conducting thorough medical examinations during the hurried inspection at the port of arrival has led to a demand that such examination should be carried on during the voyage, when there would be ample time for the work, and when the aliens could be observed for several days in succession. Definite action looking toward this end was taken at a conference of alienists and social workers held in New York City, November 16, 1912, at which the most important scientific bodies in the United States then dealing with the treatment and prevention of insanity were represented.*

This conference unanimously endorsed the adoption of "a provision authorizing the detail of commissioned medical officers of the U. S. Public Health Service to any vessels bringing immigrants to the United States, such medical officers being required to examine immigrants, with special reference to their mental condition, on the voyage to this country." This suggestion was later partially embodied in the Act of 1917, authorizing and directing the Secretary of Labor to enter into negotiations through the Department of State "with countries vessels of which bring aliens to the United States, with a view to detailing inspectors and matrons of the United States Immigration Service for duty on vessels carrying immigrant or emigrant passengers between foreign ports and ports of the United States. When such inspectors and matrons are detailed for said duty they shall remain in that part of the vessel where immigrant passengers are carried; and it shall be their duty to observe such passengers during the voyage and report to the immigration authorities in charge at the port of landing any information of value in determining the admissibility of such passengers that may have become known to them during the voyage."

So far as this committee is aware, no action on this matter has ever been taken by our Government. In view of the importance of a more thorough examination of all incoming aliens, this Committee unanimously recommends that, in so far as the existing law may be inadequate to permit the placing of inspectors and physicians on vessels bringing aliens to this country, it should at once be amended, and that the Secretary of Labor be respectfully requested to enter into the negotiations indicated in Sec. 11a of the Act of 1917, as he is there "authorized and directed" to do.

Summary of Recommendations

(1) Our immigration laws should at all times be rigidly enforced. (2) All border-line cases, which are mostly those liable to become public charges for medical reasons, should be debarred unless there is *very strong* evidence in favor of admission. (3) Appeals from adverse decisions of the boards of special inquiry should rarely be sustained, and all appeal decisions should be based on evidence only, as the law intended, and not on personal representation, or political influence. (4) Aliens should no longer be ad-

*American Medico-Psychological Association, National Committee for Mental Hygiene, New York Psychiatrical Society, New York State Charities Aid Association, Committee of One Hundred on National Health, New York State Hospital Commission, Immigration Committee of the Eugenics Section of the American Breeders Association.

mitted on bonds. They should either come in clear, or, if they are unfit, should not come in at all. (5) Registration of aliens should be required by law. (6) The time limit for deportation of insane and other eugenically undesirable aliens should be removed; all such persons should be deportable whether in institutions or not, and whether public charges or not, and the warrant of arrest should be issued by the Commissioner of Immigration or other responsible officer of the district in which the alien is resident, such official being given a hearing by the Secretary of Labor in all cases where it is intended to cancel a warrant or to suspend deportation. (7) Higher physical standards should be required and, as heretofore recommended by this Committee, no alien should be admitted whose mental capacity is not at least equal to the American average. (8) Medical inspection should be made by American medical officers during the voyage, and in so far as existing law is inadequate for carrying out this plan, it should at once be amended.

The foregoing recommendations all have to do with the enforcement of existing laws, or with changes in these laws which can be made without in any way altering the fundamental legislation already on the statute books. This Committee is unanimous in urging the adoption of the proposed amendments by Congress at the earliest possible moment.

The foregoing Report has been approved by all members of the Sub-Committee on Selective Immigration.

ROBERT DEC. WARD,
Vice-Chairman & Acting Chairman.
March 9, 1925.

Third Report of the Sub-Committee on Selective Immigration of the Eugenics Committee of the United States of America

The Examination of Immigrants Overseas, as an Additional Safeguard in the Processes of Enforcing American Immigration Policy

CONSIDERATION of the question of how far additional examination of intending immigrants to the United States in their home countries, or before final departure to the United States, is desirable and practicable, was omitted by this Committee in its second report because at that time it had not had sufficient opportunity to study the mass of new data bearing on the subject. Quite recently the whole question has been brought prominently before the public by the Hon. James J. Davis, Secretary of Labor, who has declared himself in favor of extending the principle of examination of immigrants abroad so far as practicable.

During the latter part of 1923 and early in 1924, under the auspices of the Department of Labor, a preliminary investigation of the subject was made by Dr. H. H. Laughlin in some eleven countries of Europe.* At the present time a further investigation is being conducted by officials of the Departments of State and of Labor in Europe. In view of this fact, it would be premature for this Committee to make any specific recommendations on the subject, but it believes that the data already presented by immigration offi-

*Dr. Laughlin has been for several years and now is a member of the Committee making this report, but because the Committee wished to rely considerably on Dr. Laughlin as an expert witness on the particular subject now under discussion he has taken no part in the writing of the report.

cials and by expert witnesses before the Committees of Congress are amply sufficient for a statement of this Committee's position, both as to the main benefits to be derived from examination of immigrants overseas, from the point of view of national eugenics, and as to certain important limitations to which the new proposal is subject.

While believing that examination abroad is highly desirable, both from the point of view of the United States and from the point of view of the intending immigrants, we believe that such examination should be *preliminary to, and not in substitution for, final inspection in the United States,* and that the maintenance of immigration stations at our ports of entry and along our borders will always be necessary.

This committee believes also that inspection abroad can and should be obtained in the exercise of our national right to regulate immigration to our territory, without resort to the treaty making power. We recognize that the regulation of immigration is properly a legislative function and should therefore be left in the hands of Congress, where it is at present. To allow it to become the subject of treaties with foreign governments would be to surrender our right to deal with it as a matter of domestic jurisdiction.

The new Immigration Act of 1924 has thus far been extremely successful in introducing a limited examination abroad without resorting to changes in our treaties with foreign countries. This Act, as pointed out in the second report of this Committee, already provides a process by which many "would be" immigrants not admissible under our laws are sifted out before leaving their own countries. In the opinion of this Committee a more thorough overseas examination and sifting out can be developed along the same lines. This, we believe, can be done to a considerable extent under existing law, and to a further extent with slight amendments to the present law. We have come to this conclusion in spite of the well-known fact that some foreign governments have in the past protested that this country has no right under existing treaties or under international law to inspect "would be" immigrants to the United States within the territory of the foreign government. These protests have been ably reviewed by the Hon. John C. Box, a well-known member of the House Committee on Immigration and Naturalization. In his brief submitted to that committee, Judge Box first quotes the statement of the National Immigration Commission, known as the Dillingham Commission, with respect to inspection abroad, as follows:

"This plan was so strongly urged that this Government a few years ago made official inquiry respecting the probable attitude of European governments toward it. At that time one or two governments expressed a willingness to permit such an inspection by American officials; others made indefinite replies to the inquiry, while others were positively opposed. No attempt was thereafter made to further the plan. After an investigation by the commission of the situation at all the principal ports of Europe it is clear that even were its consummation possible, such an arrangement would not materially improve conditions."

Mr. Box also quotes in his brief the Hon. Edward J. Henning, recently Assistant Secretary of Labor, who was closely concerned with the administration of the immigration laws, as saying:

"Foreign countries steadfastly have refused to allow the United States to examine immigrants at ports of departure on the ground that the exercise of that function by any nation would be in invasion of sovereignty. Attempts to extend these powers to include direct action in examination and selection of immigrants have been consistently objected to by France, Italy, and other foreign governments."

We now come to the protest made by the Italian Government through its

ambassador to the United States, under date of September 15, 1921. In a letter to Mr. Hughes, then Secretary of State, the ambassador says in part:

"During the special session of this Congress there have been presented bills—one in the Senate and two in the House of Representatives—by the terms of which, among other provisions, it is proposed to have United States medical and immigration officials in the United States consulates, or elsewhere, to exercise functions not purely informative in character but of direct action in the medical examination and definite selection of the emigrants, connecting such functions with that of the granting of the consular visé to passports.

"Such action, even if exercised in the interior of the consulate offices, would go beyond the usual consular functions recognized by treaties, and pertaining, as it does, to interests connected with emigration whose regulation is reserved to the sovereignty of each state, could not be considered as conforming with either treaty or law on emigration in Italy."

Mr. Box further refers to a letter from Secretary Hughes, dated December 28, 1921, to Congressman Albert Johnson, informing the latter of the above-mentioned protest of the Italian Government. In this letter Mr. Hughes states that in addition to the Italian protest

"Informal objections to the proposed legislation have been made by representatives of other countries."

Finally Mr. Box quotes Congressman Connally of Texas, member of the Foreign Affairs Committee of the House of Representatives, as saying that, in the hearings on the passport control bill, "it developed that practically all of the foreign countries objected to the setting up in their countries of agencies for the investigation and examination of immigrants."

The above quotations sufficiently show the general attitude taken in the past by foreign powers with regard to the power of the United States to inspect immigrants abroad, and some support for this view can be found even among American authorities on the subject. Professor J. W. Jenks, a member of the Dillingham Commission, goes so far as to say that such inspection "is a subject over which our government has no supervision, the government of the home countries being the only ones which could take effective action."*

We believe that this last statement goes much too far and that while up to a certain point the emigrant-exporting nation has exclusive jurisdiction in initiating and controlling emigration of its nationals, yet the immigrant-receiving nation acquires a considerable practical control of the matter at the point where the intending emigrant must obtain the visé of our consul to the immigration passport issued to him by his own government. It is here that the line between the two jurisdictions runs under international law. There can be little doubt on the one hand that the emigrant-exporting country would have the right to prevent any original affirmative selection by our Government accomplished by going into the homes of the nationals of the foreign country to select them for immigration purposes, or even to inspect them, unless by the express agreement or consent of the foregn government. On the other hand the immigrant-receiving nation, by refusing visés to all or a part of those presenting passports to its consuls, may, even on foreign soil, exercise a negative selection. We believe that the present Immigration Act is drawn in accordance with a sound conception of this division of jurisdiction. Without undertaking in the first instance to say who shall emigrate from the foreign country to the United States, it directs our consuls to refuse visés to all who do not present *prima facie* evidence that they are not excluded by our laws. Theoretically this might reduce the quota of a given country to zero, a re-

**The Immigration Problem,* Jenks and Lauck, Fifth Edition, Page 46.

sult which would be entirely within our power under international law, and we believe that through this power a highly useful examination of immigrants abroad may be developed along the lines of the present Act. At present the evidence required by the immigrant before he can get his visés consists only of (a) his own statement showing that he does not fall within the disqualified classes, and (b) certain documents, such as birth certificates, prison and military records, etc. We believe that it would be entirely proper to go a step further and demand that he produce reliable witnesses to support his own statements, even to the extent of demanding medical and other expert testimony to the effect that he is mentally and physically up to the standard required by our laws and that he belongs to sound family stock.

One of the chief objects of our immigration policy should be to exclude all applicants who are not at least equal to the average American citizen in physical, mental and moral attributes. In order to know that the immigrant measures up to this standard, a knowledge of his family stock as well as of his individual history is necessary. Without question, inspection overseas would be of material help in gaining such knowledge.

Even assuming the correctness of the Italian contention that it would be within the power of the Italian Government to forbid our agents to make a direct mental or physical examination of intending Italian emigrants to the United States, our Government would be equally within its rights in refusing visés to all persons (except diplomats and others specifically covered by treaty), *unless* such inspection as we demanded were permitted. Whatever may be our power in this matter, we believe that the wisest policy would be to require *the immigrant* to produce whatever evidence is necessary to make a *prima facie* case for his admissibility. For our Government to go further than this and to take the initiative in directly inspecting the immigrant through our own officials, would be possible (for reasons already given) only with the consent of the foreign power in question. Even with this consent, direct examination by United States officials overseas might be regarded as impairing the right of the United States to reject any such immigrants after subsequent inspection on their arrival in this country.

We believe that, for reasons given more fully below, such overseas examinations as is finally determined upon will be greatly to the benefit of the immigrant. By undergoing preliminary inspection in his own country, the immigrant would gain what would be of great value to him, namely the practical certainty (where he is acting in good faith) that he is free from those disqualifications which, on arriving in the United States, would debar him from entry under our laws.

In no case should he be allowed to convert this privilege into the claim that the effect of preliminary inspection abroad is to end our right to reject him, if it appears on his arrival in the United States that he is disqulified to enter the country under our laws.

Further Advantages of Overseas Examination

To the emigrant-exporting nation the advantage lies in reducing the number of deportations of its own nationals after arrival at our ports of entry and in reducing to a minimum the hardships which such deportations undoubtedly involve. Through a proper examination overseas the "would be" immigrants who are in fact disqualified from entry into our territory would as a rule be prevented from departing from their own countries.

From the point of view of the United States the advantage of preliminary overseas examination lies principally in the sifting out process it affords in addition to the present inspection at our immigration stations in this country.

It is true that the system of inspection which has been built up at our home immigration stations has reached a considerable degree of efficiency, yet statistics show that a large number of immigrants who in theory debarred from entry under our laws, nevertheless succeed in passing inspection here. Evidence introduced before the Committees of Congress in 1923-24 established the fact that there is an altogether undue proportion of aliens and of persons of foreign birth in our penal and eleemosynary institutions. Particularly is this true with regard to the criminal and the insane who, theoretically, are barred by our laws from entry into the United States if the defect exists at the time of their arrival. Past experience has shown that one line of defense is not sufficient to protect the country from the entry of those who are by law excluded. In spite of the efficiency and diligence of the immigration force employed at our home stations, we are confronted with the fact that in the past a very large number of aliens who were not legally admissible were nevertheless admitted to the United States. There can be little doubt that this situation is in part due to the fact that the information available to our inspectors at our immigration stations is not always adequate to detect in the immigrant the disqualification which in fact exists.

Dr. Laughlin has pointed out that this is particularly true with respect to cases of latent insanity and cases where the immigrant has a criminal or antisocial record. In these cases evidence obtainable only in the home country of the immigrant is much needed in addition to that which is available on personal inspection. Without the personal history of the immigrant and of his near kin there can be no certainty of discovering latent physical and mental defects. The general plan recommended by Dr. Laughlin for the extension of the examination overseas in connection with the issuance of the consular visés calls for reliable information under four heads: (1) Concerning the immigrant's individual history, (2) physical qualifications, (3) mental and educational qualifications, (4) the pedigree of the near kin of the immigrant.

Enough has been said to show that the further inspection overseas would be useful to the United States, particularly in certain cases, as supplementing the examination in this country. This is far from saying that if we had to choose between complete examination in the United States the former method would be preferable. This Committee believes the contrary to be the case; and that for several reasons. We believe in the first place that in the ordinary run of cases where the possible disqualification can be determined by the personal examination and inspection of the immigrant, inspection at our home stations is more likely to be efficient than inspection conducted on the territory of foreign countries all over the world. In Europe and the Near East alone there are one hundred and twenty-three consulates where immigration visés are granted under the present law. It is well known that conditions in the various countries, both as to the class of immigration and as to the facilities for examining immigrants, differ very widely. As already pointed out, direct inspection overseas can be effective only with the cooperation of the government in whose jurisdiction it occurs. In all probability the degree of such cooperation would vary greatly in the different countries. Moreover for some kinds of inspection, such as medical, the facilities in the matter of scientific appliances and hospitals are undoubtedly superior in this country to those afforded in most of the countries which send immigrants to the United States.

So long as the examination abroad is preliminary only—as it is at present—the fact that a final inspection is to be had on this side acts as a powerful check on any irregularities in our foreign service. No official in the employ

of our government cares to see any considerable number of immigrants who have passed their inspection abroad subsequently rejected or deported by the immigration forces at our home stations. Once remove the final inspection on this side, then the danger of laxity or positive misconduct on the part of those charged with the duty of overseas examination of immigrants is increased many fold.

It is a matter of common knowledge that the pressure to emigrate to the United States is so great in many countries today that immigrants resort to almost any means to gain their end. In view of this fact it is no reflection on the personnel of our foreign service (whose reputation is deservedly high) to hold that this country cannot afford to abandon any proper check upon the possible corruption in occasional instances in connection with the illegal entry of undesirable immigrants.

An important reason for retaining final inspection of immigrants in this country has still to be stated. Even in a case where, with the cooperation of the foreign government, a comprehensive and thorough examination might be held overseas, such examination would never guarantee that between the time of such examination and the immigrant's arrival in the United States, some disqualification, such as latent disease, or criminal record, would not come to the surface, so that the immigrant would be clearly barred from entry under our laws. Under the terms of the recent Act the period for which the immigrant's visé is good is four months in addition to the period of his final voyage, so that obviously this class of cases is by no means negligible. The argument that in such cases the immigrant should be permanently admitted to the United States is not tenable because as between the two countries involved the country of the immigrant's origin is obviously the one on whom the burden of caring for him during his after life should fall.

Finally, if we had to choose between overseas inspection of immigrants and inspection at our own frontiers, as alternative systems, there is a general reason why the latter method is in the long run sure to be the more efficient. In most matters of administration, as in the art of war, it is always the *interior lines* that are the easiest to defend. The wider the circle the more difficult the defense. In conformity with this principle the examination of immigrants at widely scattered points all over the world is less adapted to accomplishing its object than an examination concentrated on the interior lines of our home stations.

To sum up, this Commitee believes that further examination of immigrants overseas should be preliminary and supplemental to, and not be substituted for, the examination in the United States. Such additional examination abroad is desirable and feasible, from the point of view both of this country and of the country exporting emigrants to us.

The question of what immigrants should be admitted to a given country is one for that country alone to decide, and is not a matter for international regulation. The importance to the United States of maintaining this principle is obvious in view of the fact that we receive a larger number of immigrants than any other nation.

(Signed) Madison Grant,
Chairman.
Charles W. Gould,
Lucien Howe,
Roswell H. Johnson,*
Francis H. Kinnicut,
John B. Trevor,
Robert DeC. Ward.

July 3, 1925.

*Approves the accompanying Report, but favors an actual examination abroad, as well as requiring the immigrant to produce whatever evidence is necessary to establish a *prima facie* case for his admissibility.

BUD SELECTION IN THE WASHINGTON NAVEL ORANGE

Paper II. Progeny Tests of Dry Limb Variations

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THE studies of bud variations in trees of the Washington Navel orange variety were begun in April, 1909, in Southern California by the senior writer and have been continued uninterruptedly up to the present time. In this work individual tree performance records were kept of the production of a large number of trees, and reports on these studies have already been presented.[1] The presence of any marked variations of fruit or foliage of these trees were also recorded. In many trees of the Washington strain, limbs were found on which the fruit or foliage was very different from that on the remainder of the tree and these different limbs remained constant from year to year. Evidence has already been published showing the bud origin of some of these variations and their perpetuation through bud propagation.[2]

The Dry Strain

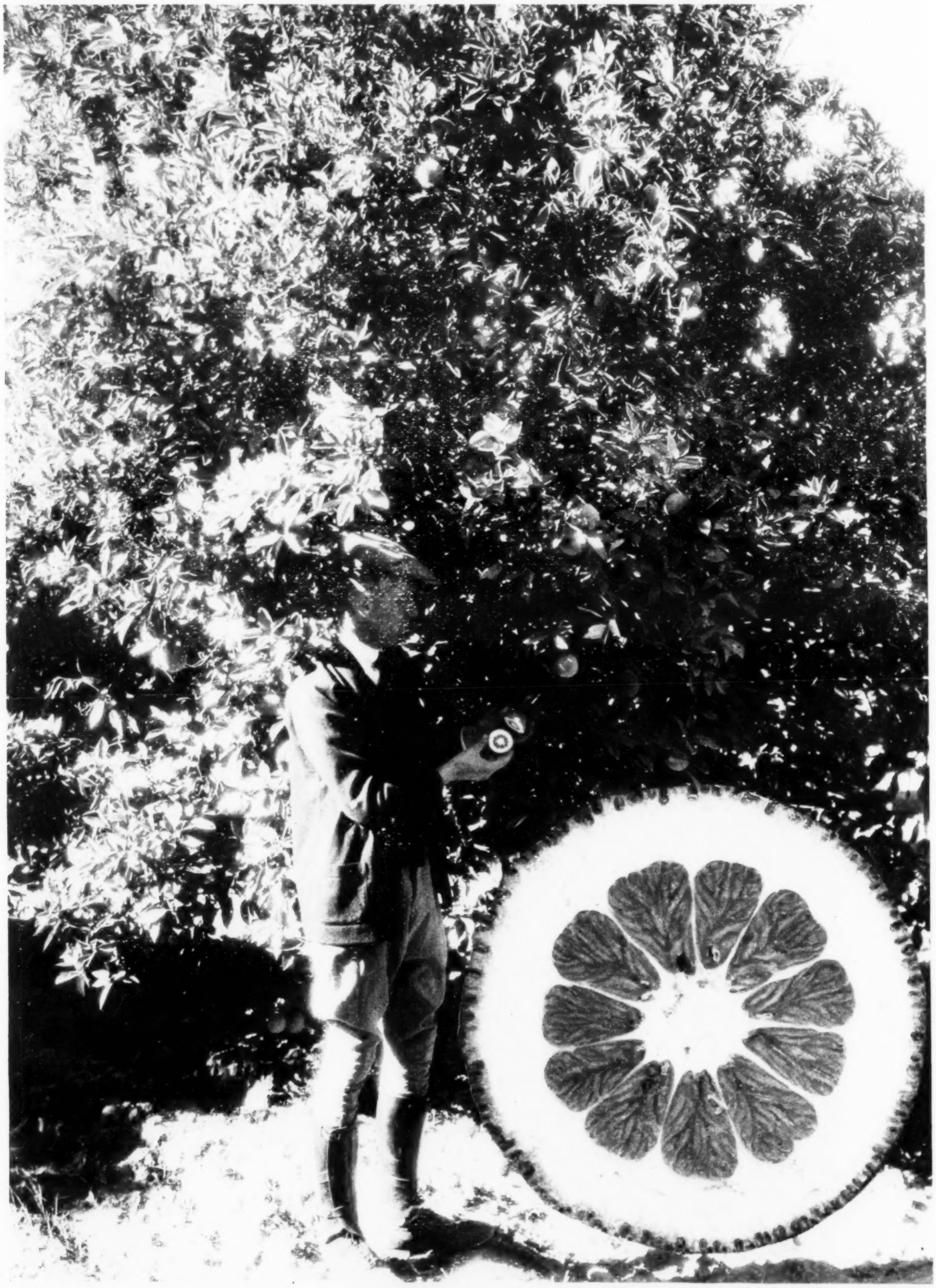
One of the very marked variations in fruit quality which has been found as limb variations several times during these investigations is fruit with little or no juice. These dry fruits are distinguished from the normal oranges on the same trees by their rather rough texture of skin and small size. Thus such limb variations are often overlooked unless the observer is familiar with the correlation of the characteristic coarse appearance of the fruits of this strain and the lack of juice.

In several Washington Navel orange orchards trees have been found bearing fruits in which the juice is almost if not wholly lacking. The close resemblance of the fruits borne by these trees to those produced by the dry-limb variations discussed in this paper indicates that they were doubtless unintentionally propagated through the accidental use of budwood secured from similar limb variations.

The trees of the dry strains of the Washington Navel orange show a finely branched arrangement and an upright habit of growth somewhat resembling that of the unproductive strain. The foliage is dense and the leaves are usually sharply pointed.

The fruits usually are globular or oblong and of medium to small size; the rinds are very thick and somewhat coarse in texture and yellowish orange in color. The rag is abundant and coarse, the juice is very scant, often wholly lacking and very insipid and inferior in quality when present. The fruits are seedless and the navels are usually small, frequently rudimentary and with the navel opening nearly or entirely closed. They are very light in weight on account of the lack of juice and are unusually uniform in size and shape.

Two types of flesh character have been observed in the fruits of this strain. In one, called the solid type, the juice cells are as abundant or even more numerous than in normal fruits, but they are compacted into a mass of coarse, dry tissue, with a complete or almost entire absence of juice. On limbs or trees of this type there is frequently a variation in the dryness of the fruit from year to year. This limb variation first came to the attention of the senior writer in 1910 in the tree shown in Figure 7, which was included in the first experimental performance



PARENT TREE—SOLID TYPE DRY LIMB VARIATION

Figure 7

This Washington Navel Orange tree bears normal fruit, except for a single limb variation of the dry strain, solid type. A section of the fruit from the variant limb is shown, natural size. Photographed at the University of California Citrus Experiment Station, Riverside, California, January 1923.

PARENT TREE—HOLLOW TYPE DRY LIMB VARIATION

Figure 8

A tree of the Washington Navel Orange, located at Ontario, California, which bears normal fruit except for a single limb, on which the fruit is typical of the dry strain, hollow type. A cross section of one of the fruits from the variant limb is also shown. For other views of these fruits see Figure 9. Photographed November, 1924.

Solid

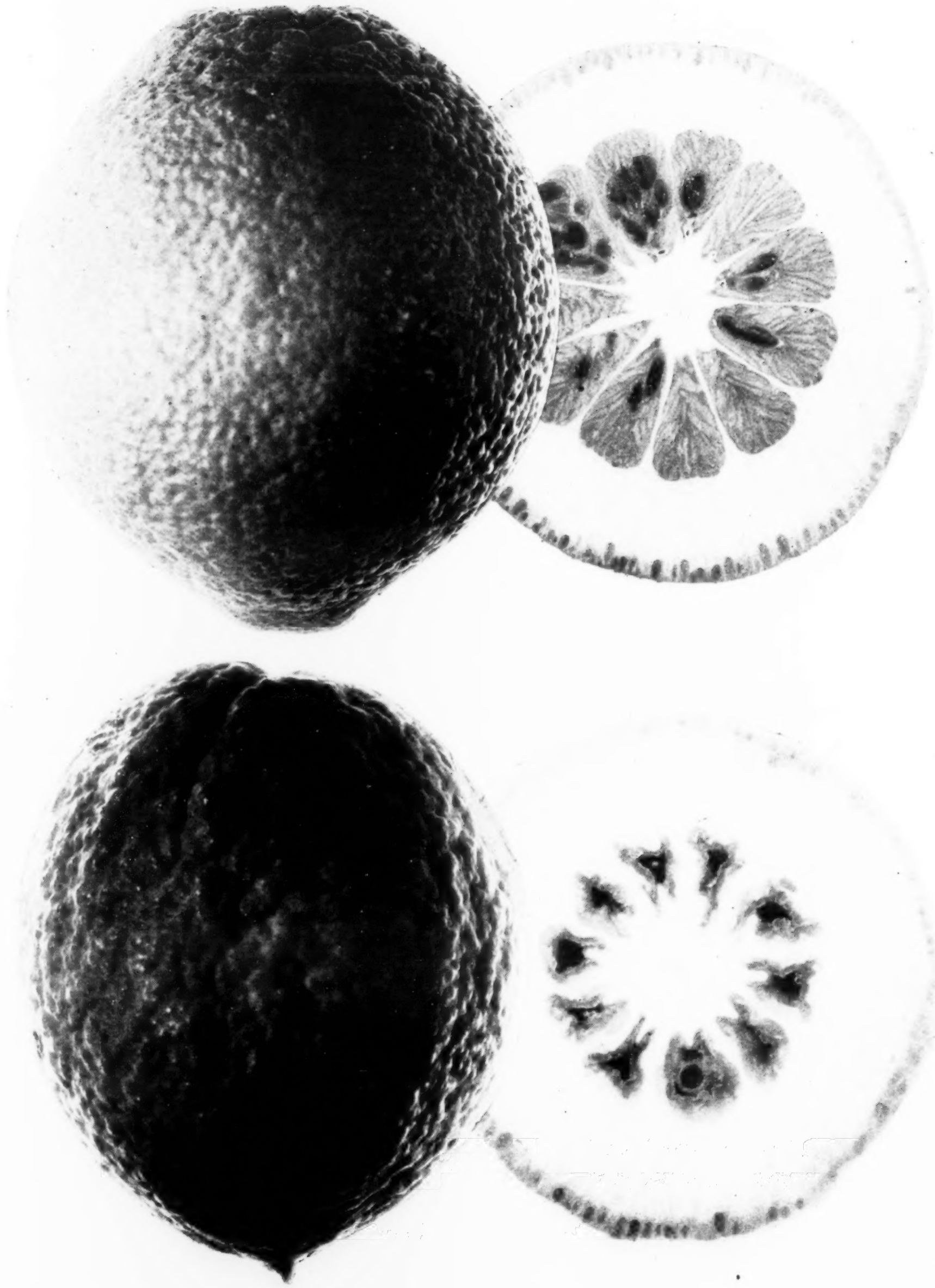
Hollow

FRUITS OF PARENT DRY LIMB VARIATIONS

Figure 9

These are fruits from the limb variations on the trees shown in Figures 7 and 8. The fruits differ considerably in structure, but are alike in having a very thick skin, and dry or nearly dry pulp vesicles.

Solid



Hollow

FRUITS FROM PROGENY TREES—DRY LIMB VARIATIONS

Figure 10

These fruits are typical of those produced by the progeny trees propagated from the two strains of the dry limb variation (See Figure 11). These undesirable types proved to be perpetuated by budding, so that they could easily be spread by careless selection of budwood.

Solid

Hollow

PROGENY TREES OF THE TWO DRY STRAINS

Figure 11

These trees were propagated from the limb variations on the two trees shown in Figures 7 and 8. Typical fruits from these progeny trees are shown in Figure 10. All fruits on these trees were like those in the limbs from which the budwood was taken. Photographed at the Citrus Experiment Station, Riverside, California, March, 1923.

record plat where detailed studies were made for eight seasons. Fruits from this limb are shown in Figure 9. A second limb variation of this same character was found in 1915 in an orchard tree belonging to the then Horticultural Commissioner of Riverside County and propagations were made from it at that time.

In the fruits of the second type of this strain, called the hollow type, the segments are nearly empty, with a central cavity partially lined with a layer of small globular pulp vesicles which are dry or nearly so. In fruits of this type the rinds are usually thicker than on those of the solid type. A limb variation of this character was found in 1914 at Ontario, Calif., by Dr. J. T. Barrett, Associate Director of the Citrus Experiment Station of the University of California, and Mr. C. S. Milliken, and Mr. W. M. Mertz, who were then on the staff of the same institution. The tree containing this limb variation is shown in Figure 8, and fruits from this limb are shown in Figure 9.

Progeny Propagation

Propagations were made in the spring of 1915 from dry-limb variations of Washington Navel orange trees, budding onto sour orange seedlings of uniform size. For some reason this budding was not very successful and only one progeny tree was secured for transplanting to the progeny orchard. This tree, shown in Figure 11, was propagated from a limb variation in the tree mentioned above belonging to the then Horticultural Commissioner of Riverside County. This progeny tree, which is of the solid type of the dry strain described above, was planted on July 2, 1917, with progeny trees of other limb variations of the Washington Navel orange in the variety or-

chard of the University of California Citrus Experiment Station at Riverside, California. Included in this same planting are two progeny trees, one of which is shown in Figure 11, which were propagated in 1914 by Dr. Barrett and Mr. Mertz from the limb variation of the hollow type mentioned above.

The orchard in which these progeny trees are located was planted on land where nothing but winter grain crops had been previously grown. Winter and summer legume cover crops have been grown in the orchard each year since and the resulting crops plowed under to improve the soil conditions, but no other fertilizing materials were used until the spring of 1924. The trees have made a healthy and normal growth and came into bearing in the fourth year after planting.

Progeny Performance Record

The progeny tree of the dry-solid limb variation has produced during the five seasons from 1920-21 to 1924-25 a total of 283 oranges, all of which have been typical of the dry-solid fruits of the parent limb as shown in Figure 10. Two comparative progeny trees of a standard Washington strain tree have produced totals of 811 and 610, respectively, of normal oranges. The yearly crops of these trees are presented in Table 1.

The two progeny trees of the hollow limb variation have produced large crops each year, but no record of the actual number of fruits produced by them has been kept up to this time. All of the fruits on those trees have shown the rough rind and other characteristics of this strain and a number of typical fruits which have been cut each year have been found to have abnormally thick rinds and to be dry, with hollow segments like those of the parent limb (see Figure 10).

The difference in composition of the fruits of the two types of the dry strain in comparison with fruits of the normal Washington strain are shown by the analyses in Table 2.

Conclusion

The commercial value of the Washington Navel orange is largely dependent upon the quantity and quality of juice in the fruits. Oranges of very low juice content are usually of inferior flavor and quality, so far as studied.

These results indicate that the quantity of juice in Washington Navel oranges varies in a marked manner and that limb variations bearing dry fruits are capable of perpetuation through asexual propagation.

These facts, together with the results previously reported, demonstrate in a most emphatic manner the great importance of bud selection in the commercial propagation of citrus trees in order to avoid the perpetuation of worthless strains.

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Table 1. Records of annual prcduction of a progeny tree propagated from a single bud of a limb variation bearing fruits of the Dry strain in a normal tree of the Washington Navel Orange variety. Similar records of progeny trees propagated from a nearby tree of the Washington strain are also given.

		Number of Fruits Produced Each Season					
Strain	Tree No.	1920-21	1921-22	1922-23	1923-24	1924-25	Total
Dry-Solid	1[a]	13	65	95	189	21	283
Washington	2[b]	13	98	27	497	176	811
	3[b]	1	91	78	337	103	610

a. All of the fruits produced by this tree have been typical of the Dry strain.

b. All of the fruits produced by this tree have been typical of the Washington strain.

Table 2. Composition[1] of fruits from progeny trees of the Dry and Washington strains of the Washington Navel orange. Tree 1 is the same as tree 1 in Table 1. Trees 2 and 3 are those shown in Figure 11 and trees 4 and 5 are nearby trees in the same progeny orchard.

Strain	Tree No.	Specific gravity of fruit	Rind	Pulp	Oil	Insoluble solids in pulp	Total sugar in juice	Acid in juice	Soluble solids in juice
			Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Dry-solid type	1	.825	48.4	51.4	.592	5.83	7.77	0.88	10.58
Dry-hollow type	2	.654	73.2	26.5	.338	9.70	8.40	0.25	too dry
Dry-hollow type	3	.640	72.6	27.1	.338	9.75	8.40	0.21	too dry
Washington	4	.899	32.1	67.4	.677	2.72	8.46	1.22	12.30
Washington	5	.912	30.4	69.5	.508	2.80	8.29	1.26	12.29

[1]These analyses were made by the Laboratory of Fruit and Vegetable Chemistry of the Bureau of Chemistry, U. S. Department of Agriculture at Los Angeles, Calif., December 1, 1924.

HERITABLE CHARACTERS OF MAIZE

XXII—Purple Plumules

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ABOUT 700 plants of Iodent corn were self-pollinated at Ames, Iowa, in the summer of 1922 in connection with the experiments in corn breeding, conducted cooperatively by the United States Department of Agriculture and the Farm Crops Section of the Iowa Agricultural Experiment Station. Among the resulting selfed ears several were found on which some of the seeds had purple plumules. On many of the ears these were indefinite and the seeds were hard to classify. On one ear, however, the seeds with purple plumules were quite distinct and studies were started with this ear to determine the mode of inheritance of the character.

Description of Purple Plumule

The purple color in purple plumule in reality is confined to the plumule sheath or coleoptile in the embryo of the seed. The color varies somewhat in intensity, but in the progenies selected for these studies it was readily distinguishable. The character is seen very easily when the plumule sheath lies tightly pressed against the pericarp (Figures 12 and 13). In some seeds, however, the cotyledon infolds the plumule so that the color of the plumule sheath is obscured. (Figure 13.) Such seeds are classified more easily after first germinating them for a few days until the plumule sheath just breaks through the pericarp. Care must be taken not to germinate them too long, as the color gradually disappears during the process of germination.

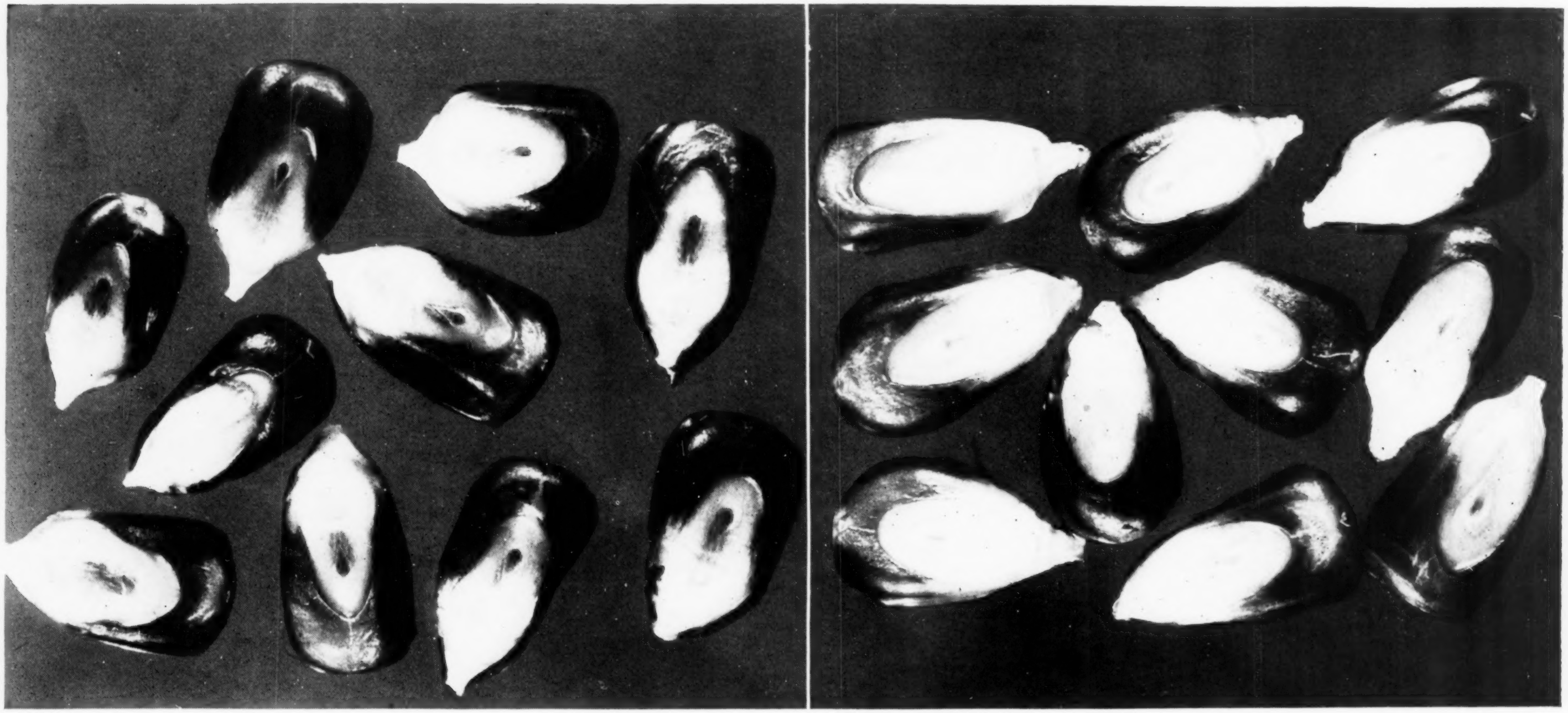
Purple plumule is a character of particular interest. It is in reality a plant character which develops in the embryonic plant and, therefore, is apparent in the seed. Since it was first noticed in 1922 in Iodent corn, it has been observed several times in other varieties.

Inheritance of Purple Plumule

The character, purple plumule, seems to be due to the action of the dominant allelomorph of a single pair of genetic factors which has been designated as *Pu pu*. The original ear with which inheritance studies were started had 173 seeds with purple plumules and 64 seeds with non-purple plumules. Seeds with purple plumules were planted from this ear in 1923 and four of the plants were self-pollinated. The four ears so obtained were all segregating for seeds with purple and with non-purple plumules. The ear on which the purple plumules were the most distinct (No. 174-4-1) was selected for further studies. Seeds were taken from this ear and those with purple and with non-purple plumules were planted in separate rows in 1924. Plants in each of the rows were self-pollinated, and back-crosses were made between plants in the two rows.

Seven self-pollinated ears on plants in a row planted with seeds without purple plumules had 1,589 seeds with non-purple plumules and no seeds with purple plumules. Such results would be expected if the factor for non-purple plumules were recessive to the factor for purple plumules.

Including the original ear, 174-4, the seventeen segregating progenies among the self-pollinated ears, had 4,072 seeds with purple plumules and 1,398 seeds



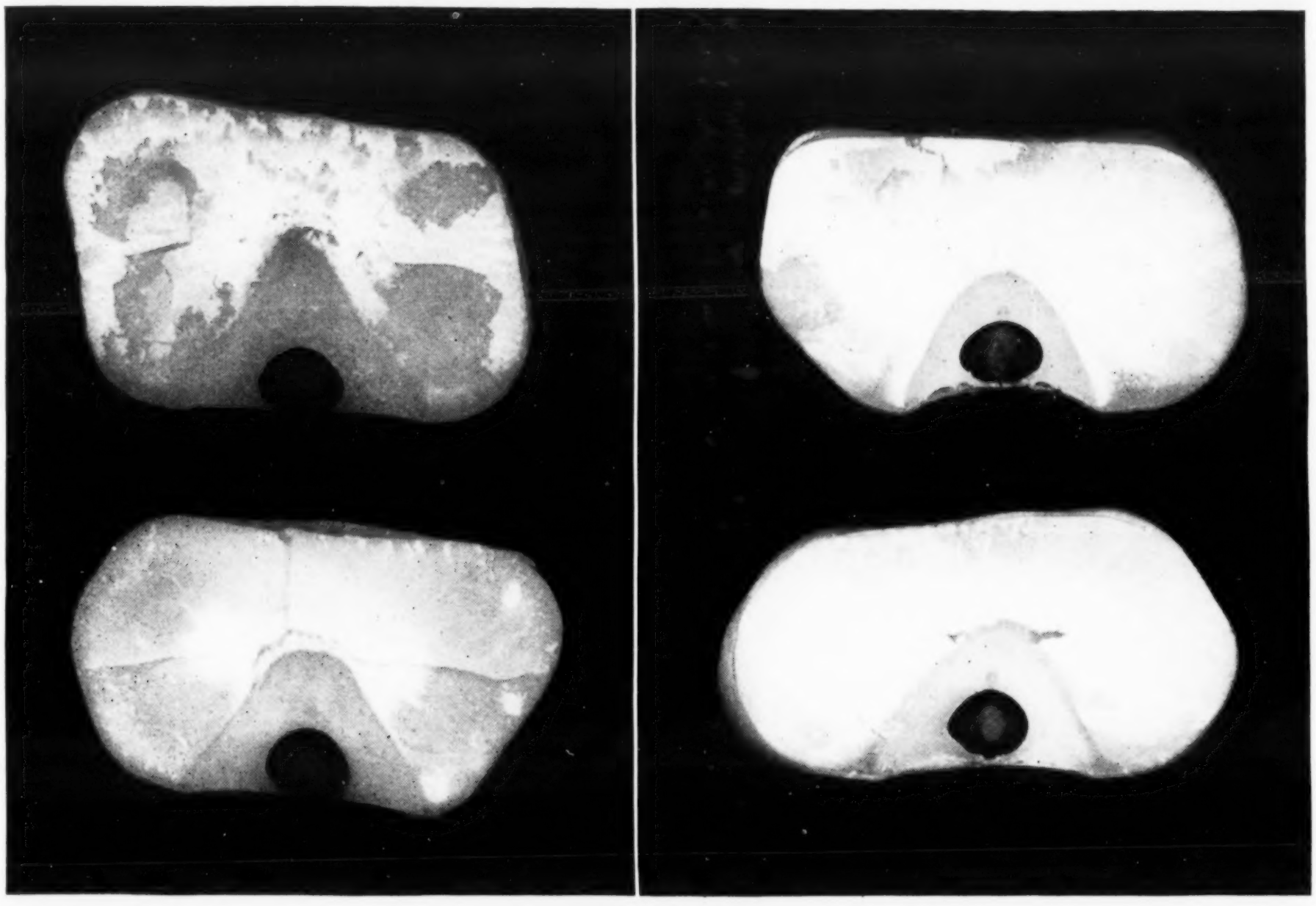
Purple Plumules

Non-purple Plumules

SEEDS WITH PURPLE AND WITH NON-PURPLE PLUMULES

Figure 12

Seeds with purple and with non-purple plumules taken from a segregating ear. This character has been noticed in a number of varieties of corn and seems to be fairly common. It appears to be due to the dominant allelomorph of a single pair of genetic factors.



CROSS SECTIONS OF SEEDS WITH PURPLE PLUMULES

Figure 13

In the seeds to the right the cotyledon infolds the plumule so that these seeds can not be classified readily without first germinating them. In the seeds to the left the plumule is pressed tightly against the pericarp and can be seen distinctly from the germ side of the seed. All of the sections show that the purple color is confined to the coleoptile or plumule sheath.

with non-purple plumules. This is a deviation of 31 ± 21.6 from a 3:1 ratio. The nine segregating progenies among the back-crossed ears, had 876 seeds with purple plumules and 829 seeds with non-purple plumules. This is a deviation from the expected 1:1 ratio of 23.5 ± 13.9. These data all indicate that purple plumule is due to the action of a single dominant factor.

If purple plumule is due to a single dominant factor, *Pu*, one-third of the seeds with purple plumules on self-pollinated ears having both kinds of seeds should be homozygous, *Pu Pu*, and two-thirds should be heterozygous, *Pu pu*. Self-pollinated or back-crossed ears on plants from the homozygous seeds should have all seeds with purple plumules and those on plants from heterozygous seeds should be segregating. A total of 34 such selfed and back-crossed ears were secured. Of these, nine ears had all seeds with purple plumules, and 25 ears were classified as segregating. This is a deviation of 2.3 ± 1.8 from the expected 1:2 ratio. It seems reasonable to conclude, therefore, that the character, purple plumule, *Pu Pu*, is a simple Mendelian dominant to the non purple, *pu pu*.

Relation of Purple Plumules to the Other Factors for Plant Color

In view of the fact that *Pu* is a factor for plant color in the embryonic plant, it is of interest to know its relation to *A*, *B* and *Pl*, the major factors for plant color in mature

plants.[1] Ear number 174-4-1, which was the source of the material planted in 1924, was homozygous for the general anthocyanin factor, *AA*. This may or may not mean that both *A* and *Pu* must be present before purple color will develop in the plumules. As this color appears to be an anthocyanin pigment it may require the presence of *A* in the same manner as the other anthocyanin pigments. Crosses involving *Pu* and the *A*, *B* and *Pl* factors have already been made and will be grown this season.

1. Emerson, R. A. The genetic relations of plant colors in maize. *Cornell Univ. Agr. Exp. Sta. Mem.* 39, 1921.

Why Babies Die

Causal Factors in Infant Mortality, by Robert Morse Woodbury. Pp. 245. U. S. Dept. of Labor, Children's Bureau Pub. No. 142, Washington, 1925.

Data from eight investigations of the Children's Bureau, comprising some 24,000 urban births, have been thrown together for the purpose of this statistical study. The bulk is offset by the heterogeneity, however, and while Dr. Woodbury has done an immense amount of careful work on the material, it is difficult to avoid being entangled in a snarl of cross-correlations, which each one will interpret according to his own preconceived ideas. The Children's Bureau has consistently championed the idea that economic factors are largely responsible for infant mortality, and, after discussing numerous other factors, Dr. Woodbury concludes that "low earnings of the father exerted a potent influence over the prevalence of these factors and therefore must be regarded as primarily responsible for the greater mortality associated with them." In short, the way to save the babies is to pay their fathers higher wages.

Many students will feel that such an analysis is superficial, and that the data of the Children's Bureau are not gathered in such a way as to reveal the primary factors involved. It is a tenable hypothesis that the father's wages reflect more or less accurately his physical and mental ability; that low wages go to fathers who are, on the average, genetically inferior; and that the child dies because it comes from poor stock, and not merely because its father got a given number of dollars in the pay envelope every Saturday night. In other words, it is the parents' heredity, and not their bank balance, that primarily determines the fate of their offspring. Doubling the pay of laborers would not reduce infant mortality to anything like a corresponding degree.

If this view of the case represents anything like the truth (and there is strong evidence, not brought out by any of the Children's Bureau investigations, or mentioned by Dr. Woodbury, that it does), the implications are extremely important. Prevention of infant mortality is then to be sought in the first place by eugenic measures and not, as the Children's Bureau seems to suppose, by "economic justice."

P. P.